Lasaulx.—On the granites of the Watawa district, Bohemia, by Dr. J. Lehmann. -On the progress of electrical appliances, by H. Coerper.—Memoir on Anoplophora (*Unionaephlig*), by Prof. von Koenen.—Obituary notice of Dr. Hermann Müller of Lippstadt, by Ernst Krause.—On the crystals of oxalate of lime present in the foliage and stem of *Iris florentina* (four illustrations), by Prof. von Lasaulx.—Remarks on a human skull and other human remains recently discovered in the loess of the Mosel near Metternich, by Prof. Schaffhausen.—Report of a geological excursion to the island of Corsica, by Prof. von Rath.—On the bacillus of tuberculosis and its presence in the human tissues, by Dr. H. Menche.—Remarks on some small crystals of leucite of unusual formation, by Prof. von Rath.—On ten small mammoth teeth from the Schipka Cave, Moravia (one illustration), by Prof. Schaffhausen.—On the action of bromide of aluminium on the dibromide of acetyl and on benzine, by Dr. Anschütz.—On a new synthesis of anthracene, by the same author.—Note on pyrites from the Gommern and Ploetzky sandstone, near Magdeburg, by Prof. von Lasaulx.—On the treatment of bites by venomous snakes, by Prof. Binz.—On a manganese and copper alloy, by H. Heusler.—Report of a scientific excursion in the island of Sardinia, by Prof. von Rath.—On the Tertiary formations of the Bonn district, by Dr. Pohlig.—On the naphtha and petroleum regions of Caucasia, by Dr. O. Schneider.—On the fossiliferous diluvium of the North German lowlands, by Dr. A. Remelé.—Microscopic examination of a series of Norwegian rocks from the Tromsoe district and the Lofoten Islands, by A. Philippson.—Effects of heat on the optical bearing of crystals, by W. Klein.—On the properties of racemic acid and of the inactive pyrotartaric acid of calcium, by Dr. Anschütz.—Geological and palæontological researches in the Bonn district, by Dr. Pohlig.—Microscopic examination of some specimens of volcanic matter from Krakatoa, by Prof. von Lasaulx.—Remarks on a new variety of glaukoppan from the island of Groix, on the west coast of Brittany, by the same author.

Rendiconti del R. Istituto Lombardo, May 29 and June 5.—Etruscan notes, by Prof. Elia Lattes.—Remarks on the laws affecting contract labour, by U. Gobbi.—On the colouring substances of putrefaction, and on some methods of discharging colours, by Dr. Paolo Pellacani.—On the supposed disposition to cretinism in patients operated on for affections of the parotid glands, by Dr. G. Fiorani.—A new determination of the latitude of the Brera Observatory, Milan, effected in the months of February and March of the present year, by L. Struve.—On a problem connected with the theory of stationary electric currents, by Prof. E. Beltrami.—On the nature of the colouring substance found in the urn of St. Ambrose, dating from the ninth century, by Prof. G. Carnellutti.—On the relation between the elasticity of some metallic wires and their electric conductibility, by Dr. G. Poloni.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, June 25.—Prof. T. G. Bonney, D.Sc., F.R.S., President, in the chair.—James Campbell Christie was elected a Fellow, and Baron C. von Ettingshausen, of Graz, a Foreign Correspondent of the Society.—The following communications were read:—Additional notes on the Jurassic rocks which underlie London, by Prof. John W. Judd, F.R.S. Since the reading of the former paper on the subject (February 6, 1884) the well-boring at Richmond has been carried to a depth of more than 1360 feet. The point reached is, reckoning from Ordnance-datum line, 220 feet lower than that attained by any other boring in the London basin. A temporary cessation of the work has permitted Mr. Collett Homersham to make a more exact determination of the underground temperature at Richmond. At a depth of 1337 feet from the surface this was found to be 75½° F., corresponding to a rise of temperature of 1° F. for every 52·43 feet of descent. The boring is still being carried on in the same red sandstones and "marls," exhibiting much false-bedding, which were described in the previous communication. The Rev. H. H. Winwood, of Bath, has had the good fortune to find the original fossils obtained by the late Mr. C. Moore from the oolitic limestone in the boring at Meux's Brewery in 1878. A careful study of these proves that, though less numerous and in a far less perfect state of preservation than the fossils from the Richmond well, they in many cases belong to the same species, and demonstrate the Great Oolite age of the strata in which they occur.—On some fossil Calcisponges from the well-boring at Richmond, Surrey, by Dr. G. J. Hinde, F.G.S.—On the Foraminifera and Ostracoda from the deep boring at Richmond, by Prof. T. Rupert Jones, F.R.S.—Polyzoa (Bryozoa) found in the boring at Richmond, Surrey, referred to by Prof. J. W. Judd, F.R.S., by G. R. Vine, communicated by Prof. Judd, F.R.S.—On a new species of *Conoceras* from the Llanvirn beds, Abercriddy, Pembrokeshire, by T. Roberts, B.A. Only five species of *Conoceras* have as yet been described; the author compared the Llanvirn species with these, and also with a fossil from the Devonian of Nassau, which Kayser referred to *Gomphoceras*, but which possesses several characters in common with *Conoceras*. The horizon from which this new species was obtained is that of the Llanvirn beds, some typical Llanvirn fossils having been found with it. The author named the species *Conoceras llanvirnensis*.—Fossil Cyclostomatous Bryozoa from Australia, by A. W. Waters, F.G.S. In the present paper the Cyclostomata from Curdies Creek, Mount Gambier, Bairnsdale, Muddy Creek, &c., Aldinga and River Murray Cliffs were described, bringing the total number of fossil Bryozoa from Australia, dealt with in this series of papers, up to 195, of which 85 are known living. Of the 32 Clyclostomata now dealt with, 12 at least are known living, and one cannot be distinguished from a Palæozoic form; 9 are apparently identical with European Cretaceous fossils. Although so many remind us of European Chalk and Miocene species, great stress was laid upon the imperfect data available for such comparisons, the Cyclostomata furnishing but few characters which are available for classification, which, so far, has, almost entirely been based upon the mode of growth, which, in the Chilostomata, has been shown to be of secondary value. In consequence of the few available characters, the Cyclostomata do not seem likely to be ever as useful palæontologically as the Chilostomata, and as they are less highly differentiated, it is not surprising to find that they are more persistent through various periods. In order to see how far other characters might be available, the author has examined Cyclostomata, both recent and fossil, from many localities and strata, and pointed out that the size of the zoœcia should always be noticed, as also the position of the closure of this tube. The arrangement of the interzoœcial pores may frequently give great assistance, and these are considered the equivalents of the rosette-plates; but the most useful character of all is no doubt the ovicell, which varies specifically in position and structure; but this unfortunately occurs on but few specimens, and has rarely been described fossil, although greater attention to this will no doubt lead to its being frequently found and noticed.—Observations on certain Tertiary formations at the south base of the Alps, in North Italy, by Lieut.-Col. H. H. Godwin-Austen, F.R.S.—On the geological position of the Weka-Pass stone, by Capt. F. W. Hutton, F.G.S. The beds described in this paper are of older Tertiary and newer Secondary age, and occur in the northern part of Ashley county, in the province of Canterbury, between the Hurinui and Waipara Rivers. All of the beds are met with at Weka Pass, on the railway and road between Christchurch and Nelson, and the following is the section in descending order:—(1) Mount-Brown beds; pale yellowish sandstone with bands of shells and coral limestone, considered by all New Zealand geologists upper Eocene or Oligocene; (2) gray sandy marl; (3) Weka-Pass stone, yellowish with arenaceous limestone, usually with small green grains; (4) Amori limestone, white, flaggy, and argillaceous; (5) green sandstone with remains of marine Saurians. The last rests conformably on beds of coal and shale, with leaves of dicotyledonous Angiosperms, forming the base of the Waipara system. To this system Nos. 4 and 5 of the above section have also been referred by Dr. von Haast and the writer. The upper beds are the Oamara system of the same authors. The question to be decided is the limit between the two. The green sandstone (No. 5) and the coal shales are generally admitted to be Cretaceous. The geographical distribution of the beds enumerated was briefly described, the gray sandy marl (No. 1), the Amori limestone (No. 4), and the green sandstone having a northerly extension to Cook's Straits, whilst the other beds have been traced to the south only. An examination of the stratigraphical evidence shows that at Weka Pass, and also on the Waipara, the Weka-Pass stone rests on a water-worn surface of the Amori limestone, and near the Pass the former overlaps the latter. The gray marl (No. 2) is evidently unconformable to the lower beds of the Waipara system, whilst at Waipara and Weka Pass it passes down conformably into the Weka-Pass stone. The gray marl also passes up conform-

ably into the Mount-Brown beds. The author concludes that the break in succession is between the Weka-Pass stone and the Amori limestone. The geological evidence is in accordance with the palæontological data. The fossils hitherto found in the Weka-Pass stone (*Voluta elongata, Scalaria rotunda, Struthiolaria senex, Pecten hochstetteri, Meomi crawfurdi, Schizaster rotundatus*, and *Flabellum circulare*) are found in other parts of New Zealand in Upper Eocene beds. None of them are known from the Cretaceous Waipara system. The fossils from the gray marl are also in some cases identical with those found in the Mount-Brown beds. The author concluded by giving reasons for not agreeing with Dr. Hector, who classes all the beds mentioned as belonging to one system of Cretaceo-Tertiary age.—On the chemical and microscopical characters of the Whin Sill, by J. J. H. Teall, F.G.S.—A critical and descriptive list of the Oolitic Madreporaria of the Boulonnais, by R. F. Tomes, F.G.S.—On the structure and affinities of the family Receptaculitidæ, including therein the genera *Ischadites*, Murch., (= *Tetragonis*, Eichw.), *Sphærospongia*, Pengelly, *Acanthochonia*, g.n., and *Receptaculites*, Defr., by Dr. G. J. Hinde, F.G.S.—On the Pliocene mammalian fauna of the Val d'Arno, by Dr. C. J. Forsyth Major, communicated by Prof. W. Boyd Dawkins, F.R.S., F.G.S.—Notes on the geology and mineralogy of Madagascar, by Dr. G. W. Parker., communicated by F. W. Rudler, F.G.S. This paper commenced with a sketch of the physical geography of the island of Madagascar. A central plateau from 4000 to 5000 feet high occupies about half the island, rising above the lowlands that skirt the coast, and from this plateau rise a number of volcanic cones, the highest, Ankaratra, being 8950 feet above the sea. With the exception of certain legends, there is no record of a period when the volcanoes were active: two such legends were given. The known volcanic cones were enumerated. They extend from the northern extremity of the island to the 20th parallel of south latitude. Beyond this, granite and other primitive rocks occur as far as lat. 22°, south of which the central parts of Madagascar are practically unknown to Europeans. Some crater-lakes and numerous hot and mineral springs occur. Earthquakes are occasionally felt in the island, most frequently in the months of September and October. The shocks are generally slight. Only a single trap-dyke is known near Antananarivo. The hills around this city are of varieties of granite (? granitoid gneiss). The general direction of the strata is parallel to the long axis of the island. Marine fossils have been found by Rev. J. Richardson and Mons. Grandidier in the south-west part of the central plateau. These fossils are referred by the last-named traveller to the Jurassic system. Remains of *Hippopotami*, gigantic tortoises, and an extinct ostrich-like bird have also been recorded. North and north-west of the fossiliferous rocks, between them and the volcanic district of Ankaratra, sandstone and slate occur. North of this volcanic district again is a tract of country in which silver-lead (mixed with zinc) and copper are found. Near the north-western edge of the central plateau are granitic escarpments facing northwards and about 500 feet high. Some details were also given of valleys through the central plateau, and of lagoons within the coral-reefs on the coasts. To these remarks succeeded some details of the physical features exhibited by the province of Imerina as seen from Antananarivo.—Notes on some Cretaceous Lichenoporidæ, by G. R. Vine, communicated by Prof. P. Martin Duncan, F.R.S.

EDINBURGH

Royal Society, July 7.—Robert Gray, Vice-President, in the chair.—Prof. James Thomson gave a geometrical solution of the problem: Given a number of points moving Galilei-wise, from their relative positions to determine a reference-frame such that the motions relatively to it may satisfy the condition.—Prof. Tait gave a quaternion solution of the same problem.—Prof. Geikie read a paper on the occurrence of drifted trees in beds of sand and gravel at Musselburgh.—Prof. Tait gave a solution of the problem: To determine the number of different ways in which a given number may be divided, no part being less than 2 or greater than one-half the given number.—Prof. C. Michie Smith gave a communication on the green sun and associated phenomena.—Mr. P. Geddes read the 5th part (psychological) of his paper on analysis of the principles of economics.

SYDNEY

Linnean Society of New South Wales, May 28.—Prof. W. J. Stephens, M.A., F.G.S., in the chair.—The following papers were read:—New Australian fishes in the Queensland Museum, by Charles W. De Vis, M.A. This, the first of a series of papers descriptive of rare and new fishes in the Queensland Museum, is confined to the *Percidæ* only. Twenty-three species are described and four new genera, viz. *Herops*, allied to *Priacanthus; Homodemus*, a fresh-water fish approaching *Dules; Auristhes*, of doubtful affinity; and *Hephestus*, a fresh-dusæ vegetable-feeding fish resembling *Lobotes*.—The Hydromedusæ of Australia, part iii., by R. von Lendenfeld, Ph.D. The Australian Hydromedusæ are here described which belong to the author's family *Blastopolypidæ*. To the species described by former authors, which are enumerated with references, several new ones are added, some of which are of greater morphological interest, particularly *Diphosia symmetrica*, nov. sp., which produces perfectly bilateral symmetrical female Gonangia. The number of species is exceedingly great. As far as some of the sub-families of this group are concerned, no other shore is inhabited by anything like such a number and diversity of forms as ours.—On the geographical distribution of the Australian Medusæ, by R. von Lendenfeld, Ph.D. The distribution of the Medusæ, or at all events of the large Rhizostomes, is shown in this paper to be entirely controlled by the ocean currents. Consequently, where the currents are permanent the range of a species can only extend in one direction.—The digestion of sponges, ectodermal or entodermal?, by R. von Lendenfeld, Ph.D. The earlier experiments, which were made to ascertain where the digestive organ of the sponge is situated, showed such different results, that the author made a series of experiments on the subject two years ago in Melbourne, and was by the help of these enabled not only to show with a large degree of probability where and how the digestion was effected in the sponge which he experimented on, but he was also enabled by these experiments to find out the cause of the great difference in the results attained by former observers. The experiments were carried on with carmine powder mixed with the water of the aquarium in which the sponge was kept. The results the author arrived at were taken up by the recent authors on sponges at home; and the second part of the question, viz. to which embryonic layer the epithelia belonged which, according to the author's researches, absorbed the food, was extensively discussed. The present paper gives an abstract of this interesting discussion, and there are also a few additions to the author's former statements.—Remarks on the coincidence of the eruption in the Straits Settlements and the red sunsets, by R. von Lendenfeld, Ph.D.

PARIS

Academy of Sciences, July 15.—M. Rolland, President, in the chair.—On Newton's rule for finding the number of imaginary roots in numerical algebraic equations, by M. de Jonquières.—On the equation in matrices $px = xq$, by Prof. Sylvester.—Second memoir on the treatment of wheaten flour, by M. Balland.—Observations of the solar protuberances made at the Royal Observatory of the Collegio Romano during the year 1883, by M. P. Tacchini.—On a lunar halo observed at Rome on the night of July 4, by M. P. Tacchini.—On a theorem in mathematical analysis of M. Fuchs, by M. H. Poincaré.—On the electrical conductivity of distilled water and of ice, by M. G. Foussereau. The author infers that under certain conditions the observation of electric resistance may supply a delicate means of testing the purity of water, and determining the slow chemical phenomena produced in liquids.—On the purification of methylic alcohol, by MM. J. Regnauld and Villejean.—Account of a deposit of saltpetre in the neighbourhood of Cochabamba, Bolivia, by M. Sacc. An analysis of this vast deposit, which is large enough to supply the whole of the world with nitrate of potash, yields the following results:—

Nitrate of potash	60·70
Borax, with traces of salt and water	30·70
Organic substances	8·60
	100·00

The author concludes that the saltpetre is the result of the decomposition of an enormous deposit of fossil animal remains.—On the action of coffee on the composition of the blood and the digestive functions, by MM. Couty, Guimaraes, and Niobey. From their experiments the authors conclude that coffee acts beneficially in stimulating the consumption and digestion of the nitrogenous elements in the food.—Note on the perception of the successive chromatic differences on luminous surfaces, by M. Aug. Charpentier.—Note on the topographic distribution of the secondary

processes of decay following on destructive lesions of the cerebral hemispheres in man and some other animals, by M. A. Pitres.—Report on the chief results of the Finnish Polar Expedition of 1883-84, by M. Selim Lemström.

BERLIN

Physical Society, June 13.—Prof. Lampe spoke on the subject of a hypothesis respecting the formation of the solar system set up by M. Faye in place of Laplace's hypothesis. According to M. Faye's theory, in the original uniform nebular mass, vortices were formed which gave rise to the existence, first of the middle planets, and then, ultimately, of the outer planets. This hypothesis was advanced as an explanation of the fact that the moons of Uranus and Neptune revolved in a direction opposite to that of the sun, the planets, and the other moons, a fact which was not accounted for by Laplace's theory. Only a brief communication, however, had yet been published of M. Faye's hypothesis, which, too, appeared to betray a number of lacunæ.—Dr. König called attention to the investigations that had hitherto been prosecuted on the subject of complementary colours, that is of those pairs of homogeneous spectral colours which, being blended together, produced a white appearance. Regarding the number of such pairs contained in the spectrum there had in all been three distinct experiments made—one by Herr von Helmholtz about the beginning of the '50's, another by Herr Schelske, and a third by Herren von Kries and von Frey. Having described the methods which had been followed in these different experiments, Dr. König proceeded to the results that had been severally arrived at, dismissing, however, without further consideration those attained by Herr Schelske as being all too defective in precision. Herr von Helmholtz had found in the spectrum seven pairs of complementary colours for his eye, Herr von Kries thirteen, and Herr von Frey, who had made use of the same apparatus as that adopted by Herr von Kries, likewise thirteen. The results represented in an arbitrary scale by the two last observers Herr König had converted into undulatory lengths, and, as in the case also of the results attained by Herr von Helmholtz, had exhibited them graphically. By drawing up the undulatory lengths of one spectrum as abscissæ, and those of the other as ordinates, he obtained for the complementary colours of the three observers certain points which, being connected together, yielded a curve of the complementary colours. While now the complementary colours were peculiar for each eye, the three curves of the complementary colours were, on the other hand, very approximate and similar to each other. Herr König then brought forward a few more considerations on complementary colours for monochromatic, bichromatic, trichromatic, and tetrachromatic eyes, demonstrating how, in the case of monochromatic eyes, there could be no question whatever of complementary colours. In the case of bichromatic eyes, on the other hand—eyes, that is, distinguishing only two ground colours, "colour-blind" eyes, as they were usually denominated—the complementary colours on their graphic representation formed quadratic surfaces lying outwardly from the neutral point. In the case of trichromatic eyes, again, they formed two curves, as was deduced from the observations, while, finally, in the case of the tetrachromatic eye, the complementary colours likewise formed curves, the curves marking the perception of the separate ground colours ranging over the whole spectrum. If, however, this last phenomenon was wanting, then complementary colours appeared only when the sectional point of the first and second curve corresponded with a shorter undulatory length than the region of the fourth curve, and the sectional point of the third and fourth curve corresponded with a longer undulation than the end of the first curve. If this condition were not fulfilled, complementary colours could not appear, a fact which would seem to militate against the possibility of a tetrachromism, that is of the existence of four ground colours.

Physiological Society, July 4.—Prof. Munk spoke on the extirpation of the cerebrum in rabbits. After a short historical survey of Prof. Christiani's and his own publications on the functions of the cerebrum, the speaker summed up the difference between his results and those of Prof. Christiani in the statement that in his most successful experiments, after removing the cerebrum, he observed in rabbits, just as in other vertebrates, birds and frogs, a state of depression lasting for a longer or shorter period, to as long as several hours, a state in which they lay apathetically, taking and keeping whatever position might be imposed on them. From this state they recovered to go through, first of all, interrupted and apparently spontaneous movements, which yet, however, on closer inspection proved to be reflex movements. These, again, were followed by a quickened reflex excitability, which finally was succeeded by compulsory movements, a kind of running stage, which, twenty-four to fifty hours after the operation, issued in the death of the animal. Prof. Christiani, on the other hand, after removing the cerebrum, in no case observed a state of depression such as that above referred to, but his excerebrated rabbits all acted like normal ones: they moved about, sprang, ran, &c., during the first twelve hours at least after the operation, which he exclusively observed. Prof. Munk then scrutinised the methods of the operation, pointing out certain minute differences between them, which he subsequently turned to account in explaining how the results deviated so widely from each other. These differences in the execution of the same operation consisted in the fact that he (Prof. Munk) made the section at a somewhat further distance (from about 1 to 2 mm.) from the optic thalami than did Prof. Christiani, and that he had made use of a knife while Prof. Christiani used the handle of a knife to separate the crus cerebri. In explanation of the phenomena observed, Prof. Munk, by means of sections and searching examinations of the brains operated on, established that the depression which at first ensued was the direct effect of the removal of the cerebrum, and that the succeeding reflex irritability and compulsory movements, the latter of which lasted till death, were due to an inflammation which extended from the surface of the incision to the cerebral ganglia, and, quite in accordance with the occurrence of the running stage, appeared sooner or later, progressed with more or less rapidity, and ultimately caused death. Prof. Christiani in his experiments did not observe the first stage, that of the exhaustion of the animal, which resulted from the extirpation of the cerebrum, but only the second or running stage following immediately on the operation, because in his procedure the severer irritation of the surface of the incision, together with the bleeding, led at once to inflammation of the cerebral ganglia, that in the case of Prof. Christiani's experiments lay so much nearer the surface of the incision.—Prof. Christiani in replying to Prof. Munk's address, rebutted the latter's interpretation, maintained in all points the validity of the results he had arrived at, and referred to a more complete publication, which was shortly to appear, in which he would prove his assertions, as well as refute the objections that had been raised.

CONTENTS